

CLAIMS

What is claimed is:

- 1 1. An apparatus comprising:
2 a buffer to store at least a default stream coded by a multiple description (MD)
3 coding and a restart stream coded by a predictive coding, the default and restart streams
4 corresponding to a media content;
5 a selector coupled to the buffer to select a transmit frame from the default and
6 restart streams according to a transmission status, the transmit frame being transmitted
7 to a receiver; and
8 an analyzer coupled to the selector to provide the transmission status based on
9 feedback information provided by the receiver.
- 1 2. The apparatus of claim 1 wherein the transmission status is one of a
2 normal condition and a restart condition, the restart condition indicating that there is a
3 frame loss in a description stream of the default stream and that it is time to transmit a
4 frame from the description stream having the frame loss.
- 1 3. The apparatus of claim 2 wherein the selector selects the transmit frame
2 from the restart stream when the transmission status is the restart condition.
- 1 4. The apparatus of claim 3 wherein the selector selects the default stream
2 after the transmit frame is transmitted.
- 1 5. The apparatus of claim 1 wherein the default stream includes a plurality
2 of description streams that are independently encoded.
- 1 6. The apparatus of claim 1 wherein the analyzer comprises:
2 a delay tracker to track delay characteristics of a transmission path; and
3 a probe tracker to keep track of probing packet to be sent over a transmission
4 path to provide path statistics.
- 1 7. The apparatus of claim 6 further comprising:

2 an input/output (I/O) module coupled to the selector to transmit the default
3 stream or the restart stream and the probing packets over a transmission path according
4 to the delay characteristics or the path statistics.

1 8. An apparatus comprising:
2 an input/output (I/O) module to receive a stream having a frame from a
3 transmitter over a transmission path, the frame being selected from one of a default
4 stream coded by a multiple description (MD) coding and a restart stream coded by a
5 predictive coding, the default and restart streams corresponding to a media content;
6 a feedback generator coupled to the receiver to provide feedback information
7 regarding transmission of the stream to the transmitter; and
8 a decoder coupled to the receiver to decode the stream.

1 9. The apparatus of claim 8 wherein the decoder comprises:
2 an error concealer to conceal error caused by packet loss.

1 10. The apparatus of claim 8 wherein the I/O module sends an
2 acknowledgment over the transmission path when the stream is received.

1 11. A method comprising:
2 storing at least a default stream coded by a multiple description (MD) coding
3 and a restart stream coded by a predictive coding in a buffer, the default and restart
4 streams corresponding to a media content;
5 selecting a transmit frame from the default and restart streams according to a
6 transmission status, the transmit frame being transmitted to a receiver; and
7 providing the transmission status by an analyzer based on feedback information
8 provided by the receiver.

1 12. The method of claim 11 wherein the transmission status is one of a
2 normal condition and a restart condition, the restart condition indicating that there is a
3 frame loss in a description stream of the default stream and it is time to transmit a
4 frame from the description stream having the frame loss.

1 13. The method of claim 12 wherein selecting comprises selecting the
2 transmit frame from the restart stream when the transmission status is the restart
3 condition.

1 14. The method of claim 13 wherein selecting comprises selecting the
2 default stream after the transmit frame is transmitted.

1 15. The method of claim 11 wherein the default stream includes a plurality
2 of description streams that are independently encoded.

1 16. The method of claim 11 wherein the providing comprises:
2 tracking delay characteristics of a transmission path; and
3 keeping track of probing packet to be sent over a transmission path to provide
4 path statistics.

1 17. The method of claim 16 further comprising:
2 transmitting the default stream or the restart stream and the probing packets
3 over a transmission path according to the delay characteristics or the path statistics.

1 18. A method comprising:
2 receiving a stream having a frame from a transmitter over a transmission path,
3 the frame being selected from one of a default stream coded by a multiple description
4 (MD) coding and a restart stream coded by a predictive coding, the default and restart
5 streams corresponding to a media content;
6 providing feedback information regarding transmission of the stream to the
7 transmitter; and
8 decoding the stream.

1 19. The method of claim 18 wherein the decoding comprises:
2 concealing error caused by packet loss.

1 20. The method of claim 18 wherein receiving the stream comprises sending
2 an acknowledgment over the transmission path when the stream is received.

1 21. An article of manufacture comprising:

2 a machine-accessible medium including data that, when accessed by a machine,
3 causes the machine to perform operations comprising:
4 storing at least a default stream coded by a multiple description (MD) coding
5 and a restart stream coded by a predictive coding in a buffer, the default and restart
6 streams corresponding to a media content;
7 selecting a transmit frame from the default and restart streams according to a
8 transmission status, the transmit frame being transmitted to a receiver; and
9 providing the transmission status by an analyzer based on feedback information
10 provided by the receiver.

1 22. The article of manufacture of claim 21 wherein the transmission status is
2 one of a normal condition and a restart condition, the restart condition indicating that
3 there is a frame loss in a description stream of the default stream and that it is time to
4 transmit a frame from the description stream having the frame loss.

1 23. The article of manufacture of claim 22 wherein the data causing the
2 machine to perform selecting comprises data that cause the machine to perform
3 operations comprising selecting the restart stream when the transmission status is the
4 restart condition.

1 24. The article of manufacture of claim 23 wherein the data causing the
2 machine to perform selecting comprises data that cause the machine to perform
3 operations comprising selecting the default stream after the restart stream is
4 transmitted.

1 25. The article of manufacture of claim 21 wherein the default stream
2 includes a plurality of description streams that are independently encoded.

1 26. The article of manufacture of claim 21 wherein the data causing the
2 machine to perform providing the transmission status comprises data that cause the
3 machine to perform operations comprising:
4 tracking delay characteristics of a transmission path; and
5 keeping track of probing packet to be sent over a transmission path to provide
6 path statistics.

1 27. The article of manufacture of claim 26 wherein the data causing the
2 machine to perform providing the transmission status further comprises data that cause
3 the machine to perform operations comprising:

4 transmitting the default stream or the restart stream and the probing packets
5 over a transmission path according to the delay characteristics or the path statistics.

1 28. An article of manufacture comprising:

2 a machine-accessible medium including data that, when accessed by a machine,
3 causes the machine to perform operations comprising:

4 receiving a stream having a frame from a transmitter over a transmission path,
5 the frame being selected from one of a default stream coded by a multiple description
6 (MD) coding and a restart stream coded by a predictive coding, the default and restart
7 streams corresponding to a media content;

8 providing feedback information regarding transmission of the stream to the
9 transmitter; and

10 decoding the stream.

1 29. The article of manufacture of claim 28 wherein the data causing the
2 machine to perform decoding comprises data that cause the machine to perform
3 operations comprising:

4 concealing error caused by packet loss.

1 30. The article of manufacture of claim 28 wherein the data causing the
2 machine to perform receiving the stream comprises data that cause the machine to
3 perform operations comprising sending an acknowledgment over the transmission path
4 when the stream is received.

1 31. An apparatus comprising:

2 means for storing at least a default stream coded by a multiple description (MD)
3 coding and a restart stream coded by a predictive coding, the default and restart streams
4 corresponding to a media content;

5 means for selecting a transmit frame from the default and restart streams
6 according to a transmission status, the transmit frame being transmitted to a receiver;
7 and

8 means for providing the transmission status based on feedback information
9 provided by the receiver.

1 32. The apparatus of claim 31 wherein the transmission status is one of a
2 normal condition and a restart condition, the restart condition indicating that there is a
3 frame loss in a description stream of the default stream and that it is time to transmit a
4 frame from the description stream having the frame loss.

1 33. The apparatus of claim 32 wherein the means for selecting selects the
2 transmit frame from the restart stream when the transmission status is the restart
3 condition.

1 34. The apparatus of claim 33 wherein the means for selecting selects the
2 default stream after the transmit frame is transmitted.

1 35. An apparatus comprising:
2 means for receiving a stream having a frame from a transmitter over a
3 transmission path, the frame being selected from one of a default stream coded by a
4 multiple description (MD) coding and a restart stream coded by a predictive coding, the
5 default and restart streams corresponding to a media content;
6 means for providing feedback information regarding transmission of the stream
7 to the transmitter; and
8 means for decoding the stream.

1 36. The apparatus of claim 35 wherein the means for decoding comprises:
2 means for concealing error caused by packet loss.